
DATA COLLECTION

EPA gathered and evaluated technical and economic data from various sources in the course of developing the effluent limitations guidelines and standards for the centralized waste treatment industry. These data sources include:

- EPA's *Preliminary Data Summary for the Hazardous Waste Treatment Industry*;
- Responses to EPA's "1991 Waste Treatment Industry Questionnaire";
- Responses to EPA's "Detailed Monitoring Questionnaire";
- EPA's 1990 - 1997 sampling of selected Centralized waste treatment facilities;
- Public comments to EPA's 1995 Proposed Rule;
- Public comments to EPA's 1996 Notice of Data Availability;
- Contact with members of the industry, environmental groups, pretreatment coordinators, Association of Municipal Sewage Authorities (AMSA), regional, state, and other government representatives; and
- Other literature data, commercial publications, and EPA data bases.

EPA used data from these sources to profile the industry with respect to: wastes received for treatment and/or recovery; treatment/recovery processes; geographical distribution; and wastewater and solid waste disposal practices. EPA then characterized the wastewater generated by treatment/recovery operations through an evaluation of water usage, type of discharge or disposal, and the occurrence of conventional, non-conventional, and priority pollutants.

The remainder of this chapter details the data sources utilized in the development of this reproposal.

PRELIMINARY DATA SUMMARY***2.1***

EPA began an effort to develop effluent limitations guidelines and pretreatment standards for waste treatment operations in 1986. In this initial study, EPA looked at a range of facilities, including centralized waste treatment facilities, landfills, and industrial waste combustors, that received hazardous waste from off-site for treatment, recovery, or disposal. The purpose of the study was to characterize the hazardous waste treatment industry, its operations, and pollutant discharges into national waters. EPA published the results of this study in the *Preliminary Data Summary for the Hazardous Waste Treatment Industry* in 1989 (EPA 440/1-89/100). During the same time period, EPA conducted two similar, but separate, studies of the solvent recycling industry and the used oil reclamation and re-refining industry. In 1989, EPA also published the results of these studies in two reports entitled the *Preliminary Data Summary for the Solvent Recycling Industry* (EPA 440/1-89/102) and the *Preliminary Data Summary for Used Oil Reclamation and Re-refining Industry* (EPA 440/1-89/014).

Based on a thorough analysis of the data presented in the *Preliminary Data Summary for the Hazardous Waste Treatment Industry*, EPA decided it should develop effluent limitations guidelines and standards for the centralized waste treatment industry. EPA also decided to develop standards for landfills and industrial waste combustors which were proposed on February 6, 1998 in the Federal Register (63 FR 6426 and 63 FR 6392, respectively). In addition to centralized waste treatment facilities, EPA also studied fuel blending operations and waste solidification/

stabilization facilities. As detailed and defined in the applicability section of the preamble, EPA has decided not to propose nationally applicable effluent limitations guidelines and standards for fuel blending and stabilization operations.

CLEAN WATER ACT

SECTION 308 QUESTIONNAIRES **2.2** ***Development of Questionnaires*** **2.2.1**

A major source of information and data used in developing the proposed effluent limitations guidelines and standards for the CWT category is industry responses to questionnaires distributed by EPA under the authority of Section 308 of the CWA. EPA developed two questionnaires, the 1991 Waste Treatment Industry Questionnaire and the Detailed Monitoring Questionnaire, for this study. The 1991 Waste Treatment Industry Questionnaire was designed to request 1989 technical, economic, and financial data from, what EPA believed to be, a census of the industry. The Detailed Monitoring Questionnaire was designed to elicit daily analytical data from a limited number of facilities which would be chosen after receipt and review of the 1991 Waste Treatment Industry Questionnaire responses.

In order to minimize the burden to centralized waste treatment facilities, EPA designed the 1991 Waste Treatment Industry Questionnaire such that recipients could use information reported in their 1989 Hazardous Waste Biennial Report as well as any other readily accessible data. The technical portion of the questionnaire, Part A, specifically requested information on:

- Treatment/recovery processes;
- Types and quantities of waste received for treatment;
- The industrial waste management practices used;
- Ancillary waste management operations;
- The quantity treatment, and disposal of

wastewater generated during industrial waste management;

- Summary analytical monitoring data;
- The degree of co-treatment (treatment of CWT wastewater with wastewater from other industrial operations at the facility);
- Cost of the waste treatment/recovery processes; and
- The extent of wastewater recycling or reuse at facilities.

Since the summary monitoring information requested in the 1991 Waste Treatment Industry Questionnaire was not sufficient for determination of limitations and industry variability, EPA designed a follow-up questionnaire, the Detailed Monitoring Questionnaire (DMQ), to collect daily analytical data from a limited number of facilities. EPA requested all DMQ facilities to submit effluent wastewater monitoring data in the form of individual data points rather than monthly aggregates, generally for the 1990 calendar year. Some facilities were also requested to submit monitoring data for intermediate waste treatment points in an effort to obtain pollutant removal information across specified treatment technologies.

Since most CWT facilities do not have analytical data for their wastewater treatment system influent, EPA additionally requested DMQ facilities to submit copies of their waste receipts for a six week period. Waste receipts are detailed logs of individual waste shipments sent to a CWT for treatment. EPA selected a six week period to minimize the burden to recipients and to create a manageable database.

EPA sent draft questionnaires to industry trade associations, treatment facilities who had expressed interest, and environmental groups for review and comment. EPA also conducted a pre-test of the 1991 Waste Treatment Industry Questionnaire at nine centralized waste treatment

facilities to determine if the type of information necessary would be received from the questions posed as well as to determine if questions were designed to minimize the burden to facilities. EPA did not conduct a pre-test of the Detailed Monitoring Questionnaire due to the project schedule limitations.

Based on comments from the reviewers, EPA determined the draft questionnaire required minor adjustments in the technical section and substantial revisions for both the economic and financial sections. EPA anticipated extensive comments, since this was EPA's first attempt at requesting detailed information from a service industry as opposed to a manufacturing-based industry.

As required by the Paperwork Reduction Act, 44 U.S.C. 3501 et seq., EPA submitted the questionnaire package (including the revised 1991 Waste Treatment Industry Questionnaire and the Detailed Monitoring Questionnaire) to the Office of Management and Budget (OMB) for review, and published a notice in the *Federal Register* to announce the questionnaire was available for review and comment (55 FR 45161). EPA also redistributed the questionnaire package to industry trade associations, centralized waste treatment industry facilities, and environmental groups that had provided comments on the previous draft and to any others who requested a copy of the questionnaire package.

No additional comments were received and OMB cleared the entire questionnaire package for distribution on April 10, 1991.

Distribution of Questionnaires **2.2.2**

In 1991, under the authority of Section 308 of the CWA, EPA sent the Waste Treatment Industry Questionnaire to 455 facilities that the Agency had identified as possible CWT facilities. Because there is no specific centralized waste

treatment industry Standard Industrial Code (SIC), identification of facilities was difficult. EPA looked to directories of treatment facilities, other Agency information sources, and even telephone directories to identify the 455 facilities which received the questionnaires. EPA received responses from 413 facilities indicating that 89 treated or recovered material from off-site industrial waste in 1989. The remaining 324 facilities did not treat, or recover materials from industrial waste from off-site. Four of the 89 facilities only received waste via a pipeline (fixed delivery system) from the original source of wastewater generation.

EPA obtained additional information from the 1991 Waste Treatment Industry Questionnaire recipients through follow-up phone calls and written requests for clarification of questionnaire responses.

After evaluation of the 1991 Waste Treatment Industry Questionnaire responses, EPA selected 20 in-scope facilities from the 1991 Waste Treatment Industry Questionnaire mailing list to complete the Detailed Monitoring Questionnaire. These facilities were selected based on: the types and quantities of wastes received for treatment; the quantity of on-site generated wastewater not resulting from treatment or recovery of off-site generated waste; the treatment/recovery technologies and practices; and the facility's wastewater discharge permit requirements. All 20 DMQ recipients responded.

WASTEWATER SAMPLING AND SITE VISITS 2.3 Pre-1989 Sampling Program 2.3.1

From 1986 to 1987, EPA conducted site visits and sampled at twelve facilities to characterize the waste streams and on-site treatment technology performance at hazardous waste incinerators, Subtitle C and D landfills, and hazardous waste treatment facilities as part of the Hazardous Waste Treatment Industry Study. All

of the facilities in this sampling program had multiple operations, such as incineration and commercial wastewater treatment. The sampling program did not focus on characterizing the individual waste streams from individual operations. Therefore, the data collected cannot be used for the characterization of centralized waste treatment wastewater, the assessment of treatment performance, or the development of limitations and standards. Information collected in the study is presented in the *Preliminary Data Summary for the Hazardous Waste Treatment Industry* (EPA 440/1-89/100).

1989 - 1997 Site Visits

2.3.2

Between 1989 and 1993, EPA visited 27 centralized waste treatment facilities. The purpose of these visits was to collect various information about the operation of CWTs, and, in most cases, to evaluate each facility as a potential week-long sampling candidate. EPA selected these facilities based on the information gathered by EPA during the selection of the Waste Treatment Industry Questionnaire recipients and the subsequent questionnaire responses.

In late 1994, EPA visited an additional four facilities which specialize in the treatment of bilge waters and other dilute oily wastes. These facilities were not in operation at the time the questionnaire was mailed, but were identified by EPA through contact with the industry and AMSA. EPA visited these facilities to evaluate them as potential sampling candidates and to determine if CWT operations at facilities which accept dilute oily wastes or used material were significantly different than CWT operations at facilities that accept concentrated oily wastes.

Following the 1995 proposal, EPA visited nine centralized waste treatment facilities, including eight additional oils facilities and one metals facility which had also been visited prior to the proposal. EPA selected these facilities

based on information obtained by EPA through proposal public comments, industry contacts, and EPA regional staff. In late 1997, EPA visited two pipeline facilities identified prior to the proposal (one via the questionnaire and the second through review of the OCPSF database and follow-up phone calls) in order to characterize operations at pipeline facilities.

During each facility site visit, EPA gathered the following information:

- The process for accepting waste for treatment or recovery;
- The types of waste accepted for treatment;
- Design and operating procedures for treatment technologies;
- The location of potential sampling points;
- Site specific sampling requirements;
- Wastewater generated on-site and its sources;
- Wastewater discharge option and limitations;
- Solid waste disposal practices;
- General facility management practices; and
- Other facility operations.

Site visit reports were prepared for all visits and are located in the regulatory record for this proposal.

Sampling Episodes

2.3.3

Facility Selection

2.3.3.1

EPA selected facilities to be sampled by reviewing the information received during site visits and assessing whether the wastewater treatment system (1) was theoretically effective in removing pollutants, (2) treated wastes received from a variety of sources, (3) was operated in such a way as to optimize the performance of the treatment technologies, and (4) applied waste management practices that increased the effectiveness of the treatment unit.

EPA also evaluated whether the CWT portion of each facility flow was adequate to assess the treatment system performance for the

centralized waste treatment waste stream. At some facilities, the centralized waste treatment operations were minor portions of the overall site operation. In such cases, where the centralized waste treatment waste stream is commingled with non-centralized waste treatment streams prior to treatment, characterization of this waste stream and assessment of treatment performance is difficult. Therefore, data from these commingled systems could not be used to establish effluent limitations guidelines and standards for the centralized waste treatment industry.

Another important consideration in the sampling facility selection process was the commingling of wastes from more than one centralized waste treatment subcategory. For example, many facilities treated metal-bearing and oily waste in the same treatment system. In such cases, EPA did not select these facilities for treatment technology sampling since EPA could not determine whether a decrease in pollutant concentrations in the commingled stream would be due to an efficient treatment system or dilution.

Using the criteria detailed above, EPA selected 14 facilities to sample in order to collect wastewater treatment efficiency data to be used to establish effluent limitations guidelines and standards for the centralized waste treatment industry. Twelve facilities were sampled prior to the 1995 proposal and four facilities (two additional and two resampled) were sampled after the proposal.

Sampling Episodes

2.3.3.2

After EPA selected a facility to sample, EPA prepared a draft sampling plan which described the location of sample points, the analysis to be performed at specified sample points, and the procedures to be followed during the sampling episode. Prior to sampling, EPA provided a copy of the draft sampling plan to the facility for review and comment to ensure EPA properly

described and understood facility operations. All comments were incorporated into the final sampling plan.

During the sampling episode, EPA collected samples of influent, intermediate, and effluent streams, preserved the samples, and sent them to EPA-approved laboratories. Facilities were given the option to split samples with EPA, but most facilities declined. Sampling episodes were generally conducted over a five-day period during which EPA obtained 24-hour composite samples for continuous systems and grab samples for batch systems.

Following the sampling episode, EPA prepared a draft sampling report that included descriptions of the treatment/recovery processes, sampling procedures, and analytical results. EPA provided draft reports to facilities for comment and review. All corrections were incorporated into the final report. Both final sampling plans and reports for all episodes are located in the regulatory record for this reproposal.

The specific constituents analyzed at each episode and sampling point varied and depended on the waste type being treated and the treatment technology being evaluated. At the initial two sampling episodes, the entire spectrum of chemical compounds for which there are EPA-approved analytical methods were analyzed (more than 480 compounds). Table 2-1 provides a complete list of these pollutants. After a review of the initial analytical data, the number of constituents analyzed was decreased by omitting analyses for dioxins/furans, pesticides/herbicides, methanol, ethanol, and formaldehyde. Pesticides/herbicides were analyzed on a limited basis depending on the treatment chemicals used at facilities. Dioxin/furan analysis was only performed on a limited basis for solid/filter cake samples to assess possible environmental impacts.

Data resulting from the influent samples contributed to the characterization of this

industry, development of the list of pollutants of concern, and development of raw waste characteristics. EPA used the influent, intermediate, and effluent points to analyze the efficacy of treatment at the facilities and to develop current discharge concentrations, loadings, and treatment technology options for the centralized waste treatment industry. Finally, EPA used data collected from the effluent points to calculate the long term averages (LTAs) for each of the proposed regulatory options. The use of this data is discussed in detail in subsequent chapters.

Table 2-1. Chemical Compounds Analyzed Under EPA Analytical Methods

Pollutant	Cas Num	Pollutant	Cas Num	Pollutant	Cas Num
<i>CLASSICAL WET CHEMISTRY</i>					
Amenable Cyanide	C-025	Disulfoton	298-04-4	Chloroneb	2675-77-6
Ammonia Nitrogen	7664-41-7	Epn	2104-64-5	Chloropropylate	5836-10-2
BOD	C-002	Ethion	563-12-2	Chlorothalonil	1897-45-6
Chloride	16887-00-6	Ethoprop	13194-48-8	Dibromochloropropane	96-12-8
COD	C-004	Famphur	52-85-7	Dacthal (Dcpa)	1861-32-1
Fluoride	16984-48-8	Fensulfothion	115-90-2	4,4'-ddd	72-54-8
Hexane Extractable Mater.	C-036	Fenthion	55-38-9	4,4'-dde	72-55-9
Hexavalent Chromium	18540-29-9	Hexamethylphosphoramide	680-31-9	4,4'-ddt	50-29-3
Nitrate/nitrite	C-005	Leptophos	21609-90-5	Diallate a	2303-16-4A
pH	C-006	Malathion	121-75-5	Diallate B	2303-16-4B
Recoverable Oil & Grease	C-007	Merphos	150-50-5	Dichlone	117-80-6
TDS	C-010	Methamidophos	10265-92-6	Dicofol	115-32-2
TOC	C-012	Methyl Chlorpyrifos	5598-13-0	Dieldrin	60-57-1
Total Cyanide	57-12-5	Methyl Parathion	298-00-0	Endosulfan I	959-98-8
Total Phenols	C-020	Methyl Trithion	953-17-3	Endosulfan Ii	33213-65-9
Total Phosphorus	14265-44-2	Mevinphos	7786-34-7	Endosulfan Sulfate	1031-07-8
Total Solids	C-008	Monocrotophos	6923-22-4	Endrin	72-20-8
Total Sulfide	18496-25-8	Naled	300-76-5	Endrin Aldehyde	7421-93-4
TSS	C-009	Parathion (Ethyl)	56-38-2	Endrin Ketone	53494-70-5
<i>1613: DIOXINS/FURANS</i>		Phorate	298-02-2	Ethalfuralin	55283-68-6
2378-TCDD	1746-01-6	Phosmet	732-11-6	Etriazazole	2593-15-9
2378-TCDF	51207-31-9	Phosphamidon E	297-99-4	Fenarimol	60168-88-9
12378-PECDD	40321-76-4	Phosphamidon Z	23783-98-4	Dicofol	115-32-2
12378-PECDF	57117-41-6	Ronnel	299-84-3	Dieldrin	60-57-1
23478-PECDF	57117-31-4	Sulfotepp	3689-24-5	Endosulfan I	959-98-8
123478-HXCDD	39227-28-6	Sulprofos	35400-43-2	Endosulfan Ii	33213-65-9
123678-HXCDD	57653-85-7	Tepp	107-49-3	Endosulfan Sulfate	1031-07-8
123789-HXCDD	19408-74-3	Terbufos	13071-79-9	Endrin	72-20-8
123478-HXCDF	70648-26-9	Tetrachlorvinphos	22248-79-9	Endrin Aldehyde	7421-93-4
123678-HXCDF	57117-44-9	Tokuthion	34643-46-4	Endrin Ketone	53494-70-5
123789-HXCDF	72918-21-9	Trichlorfon	52-68-6	Ethalfuralin	55283-68-6
234678-HXCDF	60851-34-5	Trichloronate	327-98-0	Etriazazole	2593-15-9
1234678-HPCDD	35822-46-9	Tricresylphosphate	78-30-8	Fenarimol	60168-88-9
1234678-HPCDF	67562-39-4	Trimethylphosphate	512-56-1	Dicofol	115-32-2
1234789-HPCDF	55673-89-7	<i>1656: PESTICIDES/HERBICIDES</i>		Dieldrin	60-57-1
Ocdd	3268-87-9	Acephate	30560-19-1	Endosulfan I	959-98-8
Ocdf	39001-02-0	Acifluorfen	50594-66-6	Endosulfan Ii	33213-65-9
<i>1657: PESTICIDES/HERBICIDES</i>		Alachlor	15972-60-8	Endosulfan Sulfate	1031-07-8
Azinphos Ethyl	2642-71-9	Aldrin	309-00-2	Endrin	72-20-8
Azinphos Methyl	86-50-0	Atrazine	1912-24-9	Endrin Aldehyde	7421-93-4
Chlorfevinphos	470-90-6	Benfluralin	1861-40-1	Endrin Ketone	53494-70-5
Chlorpyrifos	2921-88-2	Alpha-bhc	319-84-6	Ethalfuralin	55283-68-6
Coumaphos	56-72-4	Beta-bhc	319-85-7	Etriazazole	2593-15-9
Crotoxyphos	7700-17-6	Gamma-bhc	58-89-9	Fenarimol	60168-88-9
Def	78-48-8	Delta-bhc	319-86-8	Dicofol	115-32-2
Demeton a	8065-48-3A	Bromacil	314-40-9	Dieldrin	60-57-1
Demeton B	8065-48-3B	Bromoxynil Octanoate	1689-99-2	Endosulfan I	959-98-8
Diazinon	333-41-5	Butachlor	23184-66-9	Endosulfan Ii	33213-65-9
Dichlorfenthion	97-17-6	Captafol	2425-06-1	Endosulfan Sulfate	1031-07-8
Dichlorvos	62-73-7	Captan	133-06-2	Endrin	72-20-8
Dicrotophos	141-66-2	Carbophenothion	786-19-6	Endrin Aldehyde	7421-93-4
Dimethoate	60-51-5	Alpha-chlordane	5103-71-9	Endrin Ketone	53494-70-5
Dioxathion	78-34-2	Gamma-chlordane	5103-74-2	Ethalfuralin	55283-68-6
		Chlorobenzilate	510-15-6		

Table 2-1. Chemical Compounds Analyzed Under EPA Analytical Methods (continued)

Pollutant	Cas Num	Pollutant	Cas Num	Pollutant	Cas Num
Trifluralin	1582-09-8	Phosphorus	7723-14-0	Acrylonitrile	107-13-1
1658: PESTICIDES/HERBICIDES		Platinum	7440-06-4	Benzene	71-43-2
Dalapon	75-99-0	Potassium	7440-09-7	Bromodichloromethane	75-27-4
Dicamba	1918-00-9	Praseodymium	7440-10-0	Bromoform	75-25-2
Dichloroprop	120-36-5	Rhenium	7440-15-5	Bromomethane	74-83-9
Dinoseb	88-85-7	Rhodium	7440-16-6	Carbon Disulfide	75-15-0
Mcpa	94-74-6	Ruthenium	7440-18-8	Chloroacetonitrile	107-14-2
Mcpp	7085-19-0	Samarium	7440-19-9	Chlorobenzene	108-90-7
Picloram	1918-02-1	Scandium	7440-20-2	Chloroethane	75-00-3
2,4-d	94-75-7	Selenium	7782-49-2	Chloroform	67-66-3
2,4-db	94-82-6	Silicon	7440-21-3	Chloromethane	74-87-3
2,4,5-t	93-76-5	Silver	7440-22-4	Cis-1,3-dichloropropene	10061-01-5
2,4,5-tp	93-72-1	Sodium	7440-23-5	Crotonaldehyde	4170-30-3
1620: METALS		Strontium	7440-24-6	Dibromochloromethane	124-48-1
Aluminum	7429-90-5	Sulfur	7704-34-9	Dibromomethane	74-95-3
Antimony	7440-36-0	Tantalum	7440-25-7	Diethyl Ether	60-29-7
Arsenic	7440-38-2	Tellurium	13494-80-9	Ethyl Benzene	100-41-4
Barium	7440-39-3	Terbium	7440-27-9	Ethyl Cyanide	107-12-0
Beryllium	7440-41-7	Thallium	7440-28-0	Ethyl Methacrylate	97-63-2
Bismuth	7440-69-9	Thorium	7440-29-1	Iodomethane	74-88-4
Boron	7440-42-8	Thulium	7440-30-4	Isobutyl Alcohol	78-83-1
Cadmium	7440-43-9	Tin	7440-31-5	Methylene Chloride	75-09-2
Calcium	7440-70-2	Titanium	7440-32-6	M-xylene	108-38-3
Cerium	7440-45-1	Tungsten	7440-33-7	O+p Xylene	136777-61-2
Chromium	7440-47-3	Uranium	7440-61-1	Tetrachloroethene	127-18-4
Cobalt	7440-48-4	Vanadium	7440-62-2	Tetrachloromethane	56-23-5
Copper	7440-50-8	Ytterbium	7440-64-4	Toluene	108-88-3
Dysprosium	7429-91-6	Yttrium	7440-65-5	Trans-1,2-dichloroethene	156-60-5
Erbium	7440-52-0	Zinc	7440-66-6	Trans-1,3-dichloropropene	10061-02-6
Europium	7440-53-1	Zirconium	7440-67-7	Trans-1,4-dichloro-2-butene	110-57-6
Gadolinium	7440-54-2	1624: VOLATILE ORGANICS		Trichloroethene	79-01-6
Gallium	7440-55-3	1,1-dichloroethane	75-34-3	Trichlorofluoromethane	75-69-4
Germanium	7440-56-4	1,1-dichloroethene	75-35-4	Vinyl Acetate	108-05-4
Gold	7440-57-5	1,1,1-trichloroethane	71-55-6	Vinyl Chloride	75-01-4
Hafnium	7440-58-6	1,1,1,2-tetrachloroethane	630-20-6	1625: SEMIVOLATILE ORGANICS	
Holmium	7440-60-0	1,1,2-trichloroethane	79-00-5	1-methylfluorene	1730-37-6
Beryllium	7440-41-7	1,1,2,2-tetrachloroethane	79-34-5	1-methylphenanthrene	832-69-9
Bismuth	7440-69-9	1,2-dibromoethane	106-93-4	1-phenylnaphthalene	605-02-7
Boron	7440-42-8	1,2-dichloroethane	107-06-2	1,2-dibromo-3-chloropropane	96-12-8
Cadmium	7440-43-9	1,2-dichloropropane	78-87-5	1,2-dichlorobenzene	95-50-1
Calcium	7440-70-2	1,2,3-trichloropropane	96-18-4	1,2-diphenylhydrazine	122-66-7
Cerium	7440-45-1	1,3-dichloropropane	142-28-9	1,2,3-trichlorobenzene	87-61-6
Chromium	7440-47-3	1,4-dioxane	123-91-1	1,2,3-trimethoxybenzene	634-36-6
Cobalt	7440-48-4	2-butanone (Mek)	78-93-3	1,2,4-trichlorobenzene	120-82-1
Copper	7440-50-8	2-chloro-1,3-butadiene	126-99-8	1,2,4,5-tetrachlorobenzene	95-94-3
Dysprosium	7429-91-6	2-chloroethylvinyl Ether	110-75-8	1,2,3,4-diepoxybutane	1464-53-5
Erbium	7440-52-0	2-hexanone	591-78-6	1,3-benzenediol (Resorcinol)	108-46-3
Europium	7440-53-1	2-methyl-2-propenenitrile	126-98-7	1,3-dichloro-2-propanol	96-23-1
Gadolinium	7440-54-2	2-propanone (Acetone)	67-64-1	1,3-dichlorobenzene	541-73-1
Gallium	7440-55-3	2-propenal (Acrolein)	107-02-8	1,3,5-trithiane	291-21-4
Germanium	7440-56-4	Vanadium	7440-62-2	1,4-dichlorobenzene	106-46-7
Gold	7440-57-5	Ytterbium	7440-64-4	1,4-dinitrobenzene	100-25-4
Hafnium	7440-58-6	Yttrium	7440-65-5	1,4-naphthoquinone	130-15-4

Table 2-1. Chemical Compounds Analyzed Under EPA Analytical Methods (continued)

Pollutant	Cas Num	Pollutant	Cas Num	Pollutant	Cas Num
1,5-naphthalenediamine	2243-62-1	Acenaphthylene	208-96-8	Longifolene	475-20-7
2-bromochlorobenzene	694-80-4	Acetophenone	98-86-2	Malachite Green	569-64-2
2-chloronaphthalene	91-58-7	Alpha-naphthylamine	134-32-7	Methapyrilene	91-80-5
2-chlorophenol	95-57-8	Alpha-terpineol	98-55-5	Methyl Methanesulfonate	66-27-3
2-isopropyl-naphthalene	2027-17-0	Aniline	62-53-3	Naphthalene	91-20-3
2-methyl-4,6-dinitrophenol	534-52-1	Anthracene	120-12-7	N-C10 (N-decane)	124-18-5
2-methylbenzothiazole	120-75-2	Aramite	140-57-8	N-C12 (N-dodecane)	112-40-3
2-methylnaphthalene	91-57-6	Benzanthrone	82-05-3	N-C14 (N-tetradecane)	629-59-4
2-nitroaniline	88-74-4	Benzenethiol	108-98-5	N-C16 (N-hexadecane)	544-76-3
2-nitrophenol	88-75-5	Benzdine	92-87-5	N-C18 (N-octadecane)	593-45-3
2-phenylnaphthalene	612-94-2	Benzoic Acid	65-85-0	N-C20 (N-eicosane)	112-95-8
2-picoline	109-06-8	Benzo(a)anthracene	56-55-3	N-C22 (N-docosane)	629-97-0
2-(Methylthio)benzothiazole	615-22-5	Benzo(a)pyrene	50-32-8	N-C24 (N-tetracosane)	646-31-1
2,3-benzofluorene	243-17-4	Benzo(b)fluoranthene	205-99-2	N-C26 (N-hexacosane)	630-01-3
2,3-dichloroaniline	608-27-5	Benzo(ghi)perylene	191-24-2	N-C28 (N-octacosane)	630-02-4
2,3-dichloronitrobenzene	3209-22-1	Benzo(k)fluoranthene	207-08-9	N-C30 (N-triacontane)	638-68-6
2,3,4,6-tetrachlorophenol	58-90-2	Benzyl Alcohol	100-51-6	Nitrobenzene	98-95-3
2,3,6-trichlorophenol	933-75-5	<i>1625: SEMIVOLATILE ORGANICS</i>		N-nitrosodiethylamine	55-18-5
2,4-diaminotoluene	95-80-7	Beta-naphthylamine	91-59-8	N-nitrosodimethylamine	62-75-9
2,4-dichlorophenol	120-83-2	Biphenyl	92-52-4	N-nitrosodi-n-butylamine	924-16-3
2,4-dimethylphenol	105-67-9	Bis(2-chloroethoxy) Methane	111-91-1	N-nitrosodi-n-propylamine	621-64-7
2,4-dinitrophenol	51-28-5	Bis(2-chloroethyl) Ether	111-44-4	N-nitrosodiphenylamine	86-30-6
2,4-dinitrotoluene	121-14-2	Bis(2-chloroisopropyl) Ether	108-60-1	N-nitrosomethyl -Ethylamine	10595-95-6
2,4,5-trichlorophenol	95-95-4	Bis(2-ethylhexyl) Phthalate	117-81-7	N-nitrosomethyl-phenylamine	614-00-6
2,4,5-trimethylaniline	137-17-7	Butyl Benzyl Phthalate	85-68-7	N-nitrosomorpholine	59-89-2
2,4,6-trichlorophenol	88-06-2	Carbazole	86-74-8	N-nitrosopiperidine	100-75-4
2,6-dichloro-4-nitroaniline	99-30-9	Chrysene	218-01-9	N,n-dimethylformamide	68-12-2
2,6-dichlorophenol	87-65-0	Crotoxyphos	7700-17-6	O-anisidine	90-04-0
2,6-dinitrotoluene	606-20-2	Dibenzofuran	132-64-9	O-cresol	95-48-7
2,6-di-tert-butyl-p-benzoquinone	719-22-2	Dibenzothiophene	132-65-0	O-toluidine	95-53-4
3-bromochlorobenzene	108-37-2	Dibenzo(a,h)anthracene	53-70-3	P-cresol	106-44-5
3-chloronitrobenzene	121-73-3	Diethyl Phthalate	84-66-2	P-cymene	99-87-6
3-methylcholanthrene	56-49-5	Dimethyl Phthalate	131-11-3	P-dimethylamino-azobenzene	60-11-7
3-nitroaniline	99-09-2	Dimethyl Sulfone	67-71-0	Pentachlorobenzene	608-93-5
3,3-dichlorobenzidine	91-94-1	Di-n-butyl Phthalate	84-74-2	Pentachloroethane	76-01-7
3,3'-dimethoxybenzidine	119-90-4	Di-n-octyl Phthalate	117-84-0	Pentachlorophenol	87-86-5
3,5-dibromo-4-hydroxybenzonitrile	1689-84-5	Diphenyl Ether	101-84-8	Pentamethylbenzene	700-12-9
3,6-dimethylphenanthrene	1576-67-6	Diphenylamine	122-39-4	Perylene	198-55-0
4-aminobiphenyl	92-67-1	Diphenyldisulfide	882-33-7	Phenacetin	62-44-2
4-bromophenyl Phenyl Ether	101-55-3	Ethyl Methanesulfonate	62-50-0	Phenanthrene	85-01-8
4-chloro-2-nitroaniline	89-63-4	Ethylenethiourea	96-45-7	Phenol	108-95-2
4-chloro-3-methylphenol	59-50-7	Ethynylestradiol-3-methyl Ether	72-33-3	Phenothiazine	92-84-2
4-chloroaniline	106-47-8	Fluoranthene	206-44-0	Pronamide	23950-58-5
4-chlorophenyl Phenyl Ether	7005-72-3	Fluorene	86-73-7	Pyrene	129-00-0
4-nitroaniline	100-01-6	Hexachlorobenzene	118-74-1	Pyridine	110-86-1
4-nitrobiphenyl	92-93-3	Hexachlorobutadiene	87-68-3	Safrole	94-59-7
4-nitrophenol	100-02-7	Hexachlorocyclopentadiene	77-47-4	Squalene	7683-64-9
4,4-methylene-bis(2-chloroaniline)	101-14-4	Hexachloroethane	67-72-1	Styrene	100-42-5
4,5-methylene-phenanthrene	203-64-5	Hexachloropropene	1888-71-7	Thianaphthene (2,3-benzothiophene)	95-15-8
5-chloro-o-toluidine	95-79-4	Hexanoic Acid	142-62-1	Thioacetamide	62-55-5
5-nitro-o-toluidine	99-55-8	Indeno(1,2,3-cd)pyrene	193-39-5	Thioxanthone	492-22-8
7,12-dimethylbenz(a)anthracene	57-97-6	Isophorone	78-59-1	Triphenylene	217-59-4
Acenaphthene	83-32-9	Isosafrole	120-58-1	Tripropyleneglycolmethyl Ether	20324-33-8

Metal-Bearing Waste Treatment and Recovery Sampling 2.3.3.3

Between 1989 and 1994, EPA conducted six sampling episodes at facilities classified in the metals subcategory. Two of these facilities were re-sampled in 1996 following the proposal. Only one of those facilities sampled discharged to a surface water. The rest are indirect dischargers.

All of the facilities used metals precipitation as a means for treatment, but each of the systems was unique due to the treatment chemicals used and the system configuration and operation. Most facilities precipitated metals in batches. One facility segregated waste shipments into separate batches to optimize the precipitation of specific metals, then commingled the treated batches to precipitate additional metals. Another facility had a continuous system for precipitation in which the wastewater flowed through a series of treatment chambers, each using a different treatment chemical. EPA evaluated the following treatment technologies: primary, secondary, and tertiary precipitation, selective metals precipitation, gravity separation, multi-media filtration, clarification, liquid and sludge filtration, and treatment technologies for cyanide destruction.

EPA conducted sampling at metals facilities after the 1995 proposal to determine what effect total dissolved solids (TDS) concentrations had on the performance of metals precipitation processes. This issue was raised in public comments to the 1995 proposed rule. EPA resampled two facilities which had been sampled prior to the first proposal. The first facility formed the technology basis for the 1995 proposed metals subcategory regulatory option and the second was a facility with high levels of TDS in the influent waste stream. EPA was interested in obtaining additional data from the proposal option facility since they had altered their treatment systems from those previously sampled and because EPA failed to collect TDS

information during the original sampling episode. EPA was interested in collecting additional data from the second facility because the facility has high TDS values. EPA used data from both of the post-proposal sampling episodes to develop regulatory options considered for the re-proposal.

Oily Waste Treatment and Recovery Sampling 2.3.3.4

Between 1989 and 1994, EPA conducted four sampling episodes at oils subcategory facilities. Two additional oils facilities were sampled in 1996 following the proposal. All six are indirect dischargers and performed an initial gravity separation step with or without emulsion breaking to remove oil from the wastewater. At two facilities, however, the wastewater from the separation step was commingled with other non-oily wastewater prior to further treatment. As such, EPA could only use data from these facilities to characterize the waste streams after emulsion breaking. The other four facilities treated the wastewater from the initial separation step without commingling with non-oils subcategory wastewaters in systems specifically designed to treat oily wastewater. EPA evaluated the following treatment technologies for this subcategory: gravity separation, emulsion breaking, ultrafiltration, dissolved air flotation, biological treatment, reverse osmosis, carbon adsorption, and air stripping.

EPA conducted sampling at oils facilities in late 1994 (just before the proposal) and again after the proposal to address concerns raised at the 1994 public meeting and in the proposal public comments. Specifically, in regards to oils wastewater treatment, the commenters stated that (1) the facility which formed the technology basis for EPA's 1995 proposed option did not treat wastes which were representative of the wastes treated by many other oils facilities, and (2) EPA should evaluate dissolved air flotation as a basis for the regulatory option. All three of the

facilities sampled between 1994 and 1996 utilized dissolved air flotation and treated wastes which were generally more dilute than those treated by the 1995 proposal option facility. EPA used data from both of the post-proposal sampling episodes to develop regulatory options considered for this re-proposal. Data from the 1994 episode were not used to develop a regulatory option due to non-optimal performance and highly diluted influent streams; however, EPA used data from this facility to characterize the waste stream after emulsion breaking.

Organic-Bearing Waste Treatment and Recovery Sampling 2.3.3.5

EPA had difficulty identifying facilities that could be used to characterize waste streams and assess treatment technology performance in the organics subcategory. A large portion of the facilities, whose organic waste treatment operations EPA evaluated, had other industrial operations on-site. For these facilities, CWT waste streams represented a minor component of the overall facility flow.

Between 1989 and 1994, EPA did identify and sample three facilities that treated a significant volume of off-site generated organic waste relative to non-CWT flows. None of these facilities were direct discharging facilities. EPA evaluated treatment technologies including: air stripping, biological treatment in a sequential batch reactor, multi-media filtration, coagulation/flocculation, carbon adsorption, and CO₂ extraction. EPA chose not to use data from one of the three facilities in calculating effluent levels achievable with its in-place technologies because the facility was experiencing operational difficulties with the treatment system at the time of sampling. In addition, after reviewing the facility's waste receipts during the sampling episode, EPA determined that the facility accepted both oils subcategory and organics subcategory wastestreams and commingled them

for treatment. EPA has also not used data from a second facility in calculating effluent levels achievable with its in-place technologies because, after reviewing this facility's waste receipts during the sampling episode, EPA determined that this facility also accepted both oils subcategory and organics subcategory wastestreams and commingled them for treatment.

1998 Characterization Sampling of Oil Treatment and Recovery Facilities 2.3.4

EPA received many comments to the original proposal concerning the size and diversity of the oils treatment and recovery subcategory. Many suggested that the subcategory needed to be further subdivided in an effort to better depict the industry. As a result, in March and April 1998, EPA conducted site visits at eleven facilities which treat and/or recover non-hazardous oils wastes, oily wastewater, or used oil material from off-site. While the information collected at these facilities was similar to information collected during previous site visits, these facilities were selected based on waste receipts. The facilities represent a diverse mix of facility size, treatment processes, and geographical locations. EPA collected wastewater samples of their waste receipts and discharged effluent at 10 of these facilities. These samples were one-time grabs and were analyzed for metals, classicals, and semi-volatile organic compounds. The analytical results are located in Appendix B, but EPA has not incorporated the results into the analysis presented today. EPA plans to use this analytical data to supplement its wastewater characterization database prior to promulgation.

PUBLIC COMMENTS TO THE 1995 PROPOSAL AND THE 1996 NOTICE OF DATA AVAILABILITY 2.4

In addition to data obtained through the Waste Treatment Industry Questionnaire, DMQ,

site visits and sampling episodes, commenters on the January 27, 1995 proposal (55 FR 45161) and the September 16, 1996 Notice of Data Availability (61 FR 48805) also provided data to EPA. In fact, much of EPA's current characterization of the oily waste treatment and recovery subcategory is based on comments to the 1996 Notice of Data Availability.

As described earlier, following the 1995 proposal, EPA revised its estimate of the number of facilities in the oils subcategory and its description of the oils subcategory. Using new information provided by the industry during the 1995 proposal comment period in conjunction with questionnaire responses and sampling data used to develop the proposal, EPA recharacterized this subcategory of the industry. This recharacterization reflected new data on the wastes treated by the subcategory, the technology in-place, and the pollutants discharged. As part of this recharacterization, EPA developed individual profiles for each of the newly identified oils facilities by modeling current wastewater treatment performance and treated effluent discharge flow rates. In addition, assuming the same treatment technology options identified at proposal, EPA recalculated the projected costs of the proposed options under consideration, expected pollutant reductions associated with the options, and the projected economic impacts. EPA presented its recharacterization of the oils subcategory in the September 1996 Notice of Data Availability (61 FR 48806).

At the time of the 1995 proposal, EPA estimated there were 35 facilities in the oily waste treatment and recovery subcategory. Through comments received in response to the proposed rule, and communication with the industry, the National Oil Recyclers Association, and EPA Regional staff, EPA identified an additional 240 facilities that appeared to treat oily wastes from off-site. While attempting to confirm mailing addresses for each facility, EPA discovered that

20 of these facilities were either closed or could not be located. EPA then revised its profile of the oily waste treatment and recovery subcategory to include 220 newly-identified facilities. The information in the Notice of Data Availability was based on these 220 additional facilities.

In lieu of sending questionnaires out to the newly-identified oils facilities to collect technical and economic information, EPA used data from secondary sources to estimate facility characteristics such as wastewater flow. For most facilities, information about total facility revenue and employment were available from public sources (such as Dunn and Bradstreet). EPA then used statistical procedures to match the newly-identified facilities to similar facilities that had provided responses to the 1991 Waste Treatment Industry Questionnaire. This matching enabled EPA to estimate the flow of treated wastewater from each of the newly identified facilities. Where EPA had actual estimates for facility characteristics from the facility or public sources, EPA used the actual values. The estimated facility characteristics included the following:

- RCRA status;
- Waste volumes;
- Recovered oil volume;
- Wastewater volumes treated and discharged;
- Wastewater discharge option;
- Wastewater characteristics;
- Treatment technologies utilized; and
- Economic information.

EPA hoped to obtain information from each of the newly identified facilities through comments to the 1996 Notice of Data Availability. In order to facilitate that effort, copies of the Notice and the individual facility profile were mailed to each of the 220 newly identified facilities. Of these, EPA received comments and revised profiles from 100. Therefore, 120 facilities did not

provide comments to the Notice or revised facility profiles.

EPA determined the following about the list of newly identified oils facilities:

- 50 facilities were within the scope of the oily waste treatment and recovery subcategory;
- 16 facilities were fuel blenders;
- 31 facilities were out of scope of the oily waste treatment and recovery subcategory; and
- 3 facilities were closed.

EPA polled 9 of the 120 non-commenting facilities and determined that approximately half are within the scope of the industry. As a result, EPA estimates that half, or sixty, of the 120 non-commenting facilities are within the scope of the oily waste treatment and recovery subcategory. As to these sixty facilities that did not comment, EPA does not necessarily have facility specific information for them.

Finally, through comments to the Notice, EPA also obtained facility specific information on 19 facilities that EPA had not previously identified as possible CWT oils subcategory facilities.

Therefore, EPA's updated data base includes facility-specific information for a total of 104 facilities that are within the scope of the oily waste treatment and recovery subcategory. This total includes the 50 facilities for which EPA prepared facility information sheets, 19 new facilities identified through the Notice, and 35 facilities from the questionnaire data base. The number of in-scope facilities from the questionnaire data base has changed from the time of proposal due to other facility applicability issues, as discussed in Section 3.1. Finally, as described above, EPA estimates that the entire population of oils subcategory facilities includes an additional 60 facilities for which EPA does not have facility specific information. This brings the

total estimate of oils facilities to 164.

For this repoposal, EPA has again revised its characterization of the subcategory based on information provided prior to the 1995 proposal, during the proposal comment period, and during the Notice comment period. EPA has used the revised facility profiles and the earlier information to perform the technical and economic analyses presented for the oils subcategory. Unless noted otherwise, the final results of the analyses are scaled to represent the total population of oil facilities.

ADDITIONAL DATA SOURCES **2.5**

Additional Databases **2.5.1**

Several other data sources were used in developing effluent guidelines for the centralized waste treatment industry. EPA used the data included in the report entitled *Fate of Priority Pollutants in Publicly Owned Treatment Works* (EPA 440/1-82/303, September 1982), commonly referred to as the "50 POTW Study", in determining those pollutants that would pass through a POTW. EPA's National Risk Management Research Laboratory (NRMRL), formerly called the Risk Reduction Engineering Laboratory (RREL), treatability data base was used to supplement the information provided by the 50 POTW Study. A description of references is presented in Section 7.6.2.

Laboratory Study on the Effect of Total Dissolved Solids on Metals Precipitation **2.5.2**

During the comment period for the 1995 proposal, EPA received comments which asserted that high levels of total dissolved solids (TDS) in CWT wastewaters may compromise a CWT's ability to meet the proposed metal subcategory limitations. The data indicated that for some metal-contaminated wastewaters, as TDS levels increased, the solubility of the metal in

wastewater also increased. As such, the commenters claimed that metal-contaminated wastewaters with high TDS could not be treated to achieve the proposed limitations.

At the time of the original proposal, EPA had no data on TDS levels in CWT wastewaters. None of the facilities provided TDS data in their response to the Waste Treatment Industry Questionnaire or the Detailed Monitoring Questionnaire. Additionally, during the sampling episodes prior to the 1995 proposal, EPA did not collect TDS data. As such, EPA lacked the data to estimate TDS levels in wastewaters at the CWT facility which formed the technology basis for the 1995 proposed metals subcategory limitations.

In order to address the comment, EPA (1) collected additional information on TDS levels in metals subcategory wastewaters; (2) conducted additional sampling; (3) consulted literature sources; and (4) conducted bench scale studies.

First, EPA needed to determine the range of TDS levels in CWT metals subcategory wastewaters. As such, EPA contacted the metals subcategory Waste Treatment Industry Questionnaire respondents to determine the level of TDS in their wastewaters. Most CWT facilities do not collect information on the level of TDS in their wastewaters. Those facilities that provided information indicated that TDS levels in CWT metals subcategory wastewaters range from 10,000 ppm to 100,000 ppm (1 - 10 percent).

Second, EPA resampled the facility which formed the technology basis for the 1995 proposed metals subcategory limitations as well as one other metals subcategory facility, in part, to determine TDS levels in their wastewaters. EPA found TDS levels of 17,000 to 81,000 mg/L.

Third, EPA consulted various literature sources to obtain information about the effect of TDS levels on chemical precipitation. EPA found no data or information which related directly to

TDS effects on chemical precipitation.

Fourth, EPA conducted a laboratory study designed to determine the effect of TDS levels on chemical precipitation treatment performance. In this study, EPA conducted a series of bench-scale experiments on five metals: arsenic, chromium, copper, nickel and titanium. These metals were selected because (1) they are commonly found in CWT metals subcategory wastewaters, (2) their optimal precipitation is carried out in a range of pH levels; and/or (3) the data provided in the comments indicated that TDS may have a negative effect on the precipitation of these metals. The preliminary statistical analyses of the data from these studies show no consistent relationship among the five metals, pH levels, TDS concentrations and chemical precipitation effectiveness using hydroxide or a combination of hydroxide and sulfide. (DCN 23.32 describes the study and the statistical analyses in further detail.)

Therefore, because none of these four sources provided consistent and convincing evidence that TDS compromises a facility's ability to meet the proposed metal subcategory limitations, EPA has not incorporated the TDS levels into the development of limitations on metals discharges.

PUBLIC PARTICIPATION

2.6

EPA has strived to encourage the participation of all interested parties throughout the development of the CWT guidelines and standards. EPA has met with various industry representatives including the Environmental Technology Council (formerly the Hazardous Waste Treatment Council), the National Solid Waste Management Association (NSWMA), the National Oil Recyclers Association (NORA), and the Chemical Manufacturers Association (CMA). EPA has also participated in industry meetings as well as meetings with individual companies that may be affected by this regulation. EPA also met

with environmental groups including members of the Natural Resources Defense Council. Finally, EPA has made a concerted effort to consult with EPA regional staff, pretreatment coordinators, and other state and local entities that will be responsible for implementing this regulation.

EPA sponsored two public meetings, one prior to the original proposal on March 8, 1994 and one prior to this re-proposal on July 27, 1997. The purpose of the public meetings was to share information about the content and status of the proposed regulation. The public meetings also gave interested parties an opportunity to provide information and data on key issues.

On March 24, 1995, following the original proposal, EPA sponsored a workshop and public hearing. The purpose of the workshop was to provide information about the proposed regulation and to present topics on which EPA was soliciting comments. The public hearing gave interested parties the opportunity to present oral comments on the proposed regulation.

Finally, as detailed in the *Economic Analysis of Effluent Limitations Guidelines and Standards for the Centralized Waste Treatment Industry (EPA 821-R-98-019)*, on November 6, 1997, EPA convened a Small Business Regulatory Flexibility Act (SBREFA) Review Panel in preparing this reproposal. The review panel was composed of employees of the EPA program office developing this proposal, the Office of Information and Regulatory Affairs within the Office of Management and Budget and the Chief Counsel for Advocacy of the Small Business Administration (SBA). The panel met over the course of two months and collected the advice and recommendations of representatives of small entities that may be affected by this re-proposed rule and reported their comments as well as the Panel's findings on the following:

- Record keeping, reporting and other compliance requirements that the proposal would impose on small entities subject to the proposal, if promulgated.
 - Identification of relevant Federal rules that may overlap or conflict with the proposed rule.
 - Description of significant regulatory alternatives to the proposed rule which accomplish the stated objectives of the CWA and minimize any significant economic.
- The small entity CWT population was represented by members of the National Oil Recyclers Association (NORA), the Environmental Technology Council, and a law firm representing a coalition of CWTs in Michigan. EPA provided each of the small entity representatives and panel members many materials related to the development of this reproposal. As such, the small entity representatives had the opportunity to comment on many aspects of this reproposal in addition to those specified above. All of the small entity comments and the panel findings are detailed in the "Final Report of the SBREFA Small Business Advocacy Review Panel on EPA's Planned Proposed Rule for Effluent Limitations Guidelines and Standards for the Waste Treatment Industry" which is located in the regulatory record accompanying this rule.
- The type and number of small entities that would be subject to the proposal.